

Dialogues: The Economics of Biodiversity: Insights from UNEP with Pushpam Kumar

This is a slightly edited version of the *Dialogues for the Common Good* discussion with Pushpam Kumar, Chief Environmental Economics and Senior Economic Advisor for the United Nations Environment Program. In this episode we talk about UNEP's role in the conservation of biodiversity and ecosystem services, how environmental economics is shaping UNEP, and what still needs to be done in order to conserve and restore our biodiversity.

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It's my sincere pleasure to have Pushpam Kumar here on this episode of Dialogues for the Common Good. Pushpam Kumar is the Chief Environmental Economics and Senior Economic Advisor for the United Nations Environment Program.

Our objective today is to talk about the role of the United Nations, and in particular the United Nations Environment Program, for the conservation of biodiversity and ecosystem services. Let's give a bit of background to the issues of biodiversity and ecosystem services. In fact, there is now wide agreement between scientists that species are disappearing at alarming rates, hundreds of times faster than the natural background rate of extinction. We know that the principal causes of these are habitat loss, overexploitation of resources, pollution, climate change, and so on. In order to address these issues, the United Nations Environment Assembly had its fifth meeting in February, and the overall theme has become to strengthening actions for nature to achieve the Sustainable Development Goals. This means the UN has really started to turn its focus on biodiversity and ecosystem services. There also two main sustainable development goals set by the UN, the 12th, and the 15th, on protecting and restoring sustainable use of ecosystems, managing forests, combating desertification, and to ensuring sustainable consumption and production patterns.

What would you say is the main contribution and concern when it comes to biodiversity and ecosystem services from the perspective of the United Nations and, specifically, UNEP?

In the light of the last United Nations Environment Assembly the focus was on how we can manage nature and biodiversity in the light of the Sustainable Development Goals, which were approved by the governments of the world in 2015. The target period is 2030 and we are now in 2021. Thus, we have very short nine years left to achieve them, and, in that context, the role of UN as a catalyser and, of course, the role of UNEP, where I work, is very crucial.

What UNEP does in order to bring nature and biodiversity in the context of the Sustainable Development Goals is basically bring the best of the science in biodiversity and use this to inform the member states that these are the conditions and trends of biodiversity and how we are, sadly, losing biodiversity. The information is that we have lost quite some biodiversity, at least at a species level, and many (estimated a million plus species) are under the risk of extinction as estimated by the IPBES (Intergovernmental Panel on Biodiversity and Ecosystem Services). To build a consensus around the size is goal number one. Second is to share the application of science to the practice with the member states, and to develop the capacity to uptake those signs is another function for UNEP. Then, to implement the necessary normative work, which is decided by the member states. So, those are some of the roles which UNEP tries to perform, and all of us are really giving our best to achieve that.

When we look at some of the plans that the UN has made then there was the Strategic Plan for Biodiversity 2011 to 2020 which, for example, also contained the Aichi biodiversity targets. What progress has been made?

Aichi is a Japanese name meaning 'glimpses of hope'. We could not make the kind of progress which was envisioned in 2011. Just to give you concrete information, the Aichi targets had 20 targets that can be translated into 60 elements: how much land to protect, what are the explicit levels we have to achieve, and so on. Seven elements of those targets were really achieved. Thirteen made a good progress, and on 38 we failed. The accomplishments for two elements are still unknown. And that tells us something important: that the Aichi targets needed much more clarity in terms of science, which was not available, at least for the governments or the level at which the decisions are taken.

It is not surprising that many of the governments had difficulty in understanding what actually they have to undertake in order to achieve those targets. And that is not very encouraging. There were a lot of good discussions, and awareness was raised. Some of the results like access and benefit sharing of the conservation to some extent has been achieved. Governments are more aware about what they need to do now, which was unavailable earlier. The short answer is that it's not about UNEP: we have to understand that the actions have to be taken by the member states. I think that is where we could not achieve what we could have. The answer is not going to please you, and neither many of us.

As 2020 is over, what are the next steps and, in particular, what would be the focus of the post 2020 biodiversity plan?

We now have an excellent plan for a post 2020 biodiversity framework and implementation due to a lot of groundwork which has been done with the help of scientists and also the governments. We have a [draft document](#) which will go to Kunming in COP 15 (15th Conference of Parties) of the CBD (Convention on Biological Diversity), which the governments will discuss and there is a very high chance that this document will be accepted.

Now, very briefly, this document is building upon the lessons learned from the Aichi Targets, which you refer to. One of the basic things that we have done is come out with smart indicators of biodiversity. Biodiversity is still a very science-centric word, not for academics and research, but if you went to a secretary or a minister, they were not familiar with this. That problem has gone now.

There is a very good progress on smart indicators for biodiversity at least at the species level. So that is in the document, which is basically talking about the action in the post 2020 era. This document is talking about what are the direct drivers of the biophysical side, like habitat fragmentation or invasive species, extreme events or climate change, and also indirect drivers. Those will be of interest for our fraternity from the economic side, like costing, the pricing, the fiscal, the subsidies, and a lot of tools and approaches through which biodiversity can be integrated or mainstreamed in the various sectors of the economy, including fiscal and monetary policies, labour markets, capital markets, good market, external sector, incentives for investment. Those measures are fully elaborated in this document.

Right now, I may not be able to tell you what percent the governments would commit to that. I mean, as you know, many governments have already stated that they are going to declare 30% of their marine area and the land area as protected area. This might change, as scientists are saying 44% is necessary, but we will land somewhere, and where exactly is a part of negotiation, which will happen in China, in the coming meeting.

So all these three elements, about conservation, about the use of economic tools and techniques, and human rights-based approach to nature, for the people, you will find in this global biodiversity framework 2020. And we have to see what emerges finally, but the document is fantastic, a lot of time and energy and effort has come from various stakeholders, including eminent scientists from the world. And we have to wait where we land in China under COP 15.

What you've been saying is that the measurements have improved and our understanding of some of the economics approaches that we can do in order to deal with issues of biodiversity and ecosystem services has improved and it's being more and more integrated. So the key is really what the governments in the end will be doing. Let's come back to that question a bit later.

Let's talk a bit more about one of your colleagues, Partha Dasgupta. Partha recently wrote this impressive review, "[The Economics of Biodiversity: The Dasgupta Review](#)". And at least from what I can tell, that looks like a game changer. It brings a lot of new understanding from our point of view. There's a huge impact at least on policy and on institutions. So, in terms of the post 2020 biodiversity plan and for UNEPs work on restoration and recovery, what impact would you say will the Dasgupta review have?

I fully agree with you that this independent review of the economics of biodiversity by HM Treasury of UK and led by Sir Partha Dasgupta of Cambridge definitely has all the elements to be a game changer. And when we analyze the governments' reports from the last 100 years, since the UK Coals Commission, I don't think any report has had such a structured narrative.

As Partha explained in the review, all we homo sapiens are embedded in nature. He notes that the management of nature is just like an asset management problem. He does talk about the need for new metrics of measuring progress and sustainability. Also, he gives toolkits to measure natural capital, such as the pricing of biodiversity, and he talks about rethinking social norms. And, in fact, in a 600 page documents, he, in a very perceptive way, provides the rational and need to change the grammar of conventional economics to understand the role of nature, especially for biodiversity. The framework that he provides is to treat the problem like portfolio choice theory.

I have been participating in many of the seminars and webinars from the south, from Sub Saharan Africa, Amazonia, South Asia. Governments, not from the forest ministry, not from the biodiversity or climate change ministry, but finance ministry, are asking how we can translate these recommendations into actions to conserve biodiversity.

The way the report is making news not only affects the academics, in the journals or newspapers, but also the world of the practitioners. I think this will be a game changer. And I'm sure, Partha and his team will be present at the UNFCCC and COP meetings of climate change and COP 15 in China, which we referred to earlier, to discuss. I suspect they have a plan to engage with the national governments globally, just like the way Nick Stern did for climate change in 2006.

Part of the reason that this report attracts so much attention is that it has come from the Treasury in UK, so banks, financial institutions, multilateral trust banks like the Africa Development Bank, or the Asian Development Bank, and even IMF and World Bank are curious, they want to know more, and they want to act on it. And also part of the reason is because of Partha Dasgupta: he has spent at least 50 years in this profession and has made a mark, along with the likes of Kenneth Arrow, Karl Göran, Marty Weitzman.

Once the report goes to the Ministries of Finance, the Ministries of Development and Planning, and financial institutions, we should hope that it will be a game changer. It will be a game changer

because the major drivers of change for biodiversity and nature are emerging from finance for development. The way we are developing our cities, the way we are using energy, the way we are using our forest land, the way we are using surface and groundwater, all this depends on the way we invest, and these ministries inject the investment in the economy and create changes.

Let's stick a bit more with this topic of media appearance and implications for policy. Everybody heard about the COP meetings on climate change which frequently figure in the news. However, the Conference of Parties to the Convention on Biological Diversity seldomly features in the media at all. Why would you say this is the case?

There are a few elements, which can be part of the answer to your question. First, climate change has a history around it as it has started in the early mid 80s with the first assessment report. And so, for at least 40 years, there is a history and assessment of the trends and conditions of climate change. So there is some credibility and clarity.

Second, climate change is a very simple issue. I mean, not in terms of impact, don't get me wrong, but what is the mixture of gases? Carbon dioxide, NO_x, SO_x, methane, maybe few others. The sources and impacts are very obvious.

The third point concerns the climate change impact. In the beginning, people thought that climate change is happening more in the north, in Europe, in North America, and OECD countries. So a lot of resources were located towards funding further research. For the case of biodiversity, instead, one always thought that this is a problem in the south, such as in Brazil, in India and South Africa, in DRC, Congo, Indonesia.

Also, biodiversity is not as simple as climate change. What is biodiversity? It ranges from the DNA to biomass level, with changes that are much more capriciously than an economist or planners can think of. They can change on a fraction of seconds at a DNA level, to a millions of years. There is a huge problem with measurement at the unit scale. Their modus operandi, or at least many of the happenings in biodiversity, are not easily amenable to economic analysis, or financial analysis, in contrast to climate change.

I don't think I'm quite in agreement with you that biodiversity is not getting attention, maybe not like climate change, but it is getting it. The very fact is that even the IMF, the World Bank, other agencies such as the UNEP are widely concerned to integrate biodiversity in our program work, where biodiversity and nature is a kind of cornerstone for all the program of work. So you're right it is not like climate change, but it is picking up for the obvious reasons.

We know now that biodiversity directly impacts people, their material conditions, especially in the south. But until very recently, people thought biodiversity means the green space in the city, or some nice wildlife. And we understand that, especially due to this pandemic, that nobody can undermine the importance of biodiversity any longer. All these zoonotic diseases, habitat fragmentation, illegal trade of oil, the impact on lives. And, of course, climate change is one of the drivers of changes in biodiversity.

I'm sure in COP 15 there will be a big discussion on how to avoid future pandemics. In fact, this has been happening in my view, see the SARS, Ebola, MERS, Zika, but we have not been paying attention. Scientists have been warning us that the way we are using biodiversity might cause this transmission of viruses from animals to humans. Today we are spending \$14 trillion on the recovery. This is most likely nothing compared to the kind of costs we have to bear as a result of the destruction of habitat and biodiversity. And certainly this also points out the dysfunctional relationship between man and nature.

So, yes, maybe in popular media biodiversity is not getting attention. I mean, it is there not as much as climate. I'm sure you are right. But it is coming up in a big way. And there is no other way to think about our development paradigm but to think about nature and biodiversity.

UNEP helped to basically establish and to coordinate the National Biodiversity Strategies and Action Plans. They are a bit like the Nationally Determined Contributions towards emission reductions, where governments say: Okay, this is what I'm going to do in order to reduce emissions, or in order to improve biodiversity or ecosystem services, and here is a certain plan where during the next 10 years we would like to achieve this or that. How serious do the governments take these plans?

We at UNEP engage with governments directly, in addition to our environment assembly. The CBD conventions on biodiversity have action plans, which are then implemented by those governments who have ratified the conventions. It then also becomes obligatory for them to report on what they have done in order to implement those targets. In fact, a large number of governments do report about their national action plan. There are some great success stories, too, as a large number of countries are very supportive, excited and participative. Many of them are leading the whole implementation plan in a big way. For example, Pakistan with its 10 billion trees tsunami: Pakistan wants to plant 10 billion tree in their country during the next few years, and they have already planted one billion. We estimated the inclusive wealth in Pakistan and have observed that natural capital in Pakistan has shown very good progress since 2018.

At the same time, the response is certainly mixed. Part of the reason is that the way scientists are communicating the message needs improvement. Also, many countries are very keen and they want to comply as they have understood that conserving biodiversity is not for the sake of biodiversity itself, but it is also for their own people. In a welfare state, who will not take care of their own people? But the problem these governments face is one of implementation gap. How to do it? What is the guidance? What is the pathway, where is the capacity?

For example, take the case of inclusive wealth. We economists always talk that we need to understand inclusive wealth as it gives a better picture of sustainability and how it is changing. We at UNEP get many requests from governments asking us whether we can help to calculate countries' inclusive wealth. So it's not that they are averse, but often they lack the capacity. Many countries in the south use the statistical system of national accounts of 1968. We are in 2021. There's always a time lag, but we definitely need to focus a lot on capacity building. So, in fact, my sincere appeal to the scientific community and environmental economists across the globe would be to also focus on, or give some time to, capacity building. We need to know how to translate the scientific language into a very simple language. I'm not saying everything should be reduced to very simple terms. The world is not so simple world, in fact it is rather complex. So we might require some complex language, but at least part of the science must be translated into simple language. And that applies to many of the action plans and biodiversity agenda indicators. They need to be mainstreamed.

You were also referring to the global biodiversity framework 2020. There's a lot of emphasis on biodiversity accounting, valuation of biodiversity, how to link biodiversity with every sector. It is also important to capture and demonstrate those linkages, which will certainly help because biodiversity and nature is entering into consumption, production, and also distribution. This may require us to revise the textbook of conventional economics. And that is what the Dasgupta review does in a very elegant way.

So to answer your question, there is a mixed reaction from the governments. But personally, I'm encouraged because when I compare the 1990s to 2020, then there's a huge change. There is so

much political consensus regarding the need to move beyond GDP. Today we don't need much more evidence, there is evidence, there is a consensus. Now the next tranche will be as to how to help countries to really implement changes. It's not anymore as to what we need to do, but how to do it now? What is the best way to do it?

I see that there's maybe an additional issue, and that is that these national biodiversity strategies and action plans contain non-binding commitments. And since they are non-binding, it just makes them that much less credible. And it means that governments just say they would like to do something, but they don't want to formally commit to action. Why do you think is it so difficult to nudge governments into providing binding commitments in the case of biodiversity, whereas we actually achieved binding commitments for the case of climate change?

The Secretariat at UNEP is certainly in favour of having very concrete binding constraints, but for that state governments have to agree. As I referred earlier, issues in biodiversity are a little more complex than climate change science. So let us hope that in China they agree on this. In fact, at least in terms of the Protected Areas, binding commitments are also on the agenda. I think there will be some very good progress in COP.

Let's say governments want to do something about biodiversity, and they also want to stick to their action plans. Let's think this a bit more now in economic terms. So in 1950, around 65% of the world was wilderness in 2021. We are currently at 35%. If the trends continue, then around 25% of wilderness will be left in 2040. Is there any consensus on what is the optimal level of biodiversity, or of the biosphere?

That's a good question. And possibly very hard to answer. The optimal level of biodiversity will certainly depend upon the country contexts and the local carrying capacity. There is a term called guiding the capacity of the space, which the Beijer International Institute for Ecological Economics used for quite some time. And many geographers still use that term, it is very relevant because it is a function of the population density. Throughput, in the sense of how much resource we are taking from the nature and how much waste we are dumping. As you know, plastic pollution is a big issue now, by 2030, we will have more plastic in the ocean than the fish. And so, it will serve if not by country, certainly by geographical region. I think this has been estimated for Scandinavian countries, and Western Europe, if not Eastern Europe. I think there are some good estimates that what should be the optimal level of biosphere, I may not be able to give you the statistics for a specific country, but there are. It has been estimated at the regional level, if not at the national level. So, I may not be able to give you the exact answer as to what is the optimal level of the biosphere, but it can certainly be worked out. I think, again, going back to Dasgupta review, when he talks about demand the gap between the supply and demand of the ecosystem. He refers to this.

Assume we figured out what the optimal level of the biosphere is, or how we can close the gap. Let's compare this to the problem of climate change. If you want to solve the climate change problem, then we economists we found a simple solution: we just price carbon and in theory that will solve all the problems associated with that. Of course, we can introduce some additional regulation on some incentives in order to deal with further externalities like R&D and so on. But, in general, a simple Pigouvian tax should do the job. So, why is there no discussion to place a similar price on biodiversity or on nature in general?

There is a talk about valuation of biodiversity, in not only the Dasgupta review, but also in the global biodiversity framework. There is a separate paragraph, where it is recommended that valuation and pricing of biodiversity will be helpful. But we have to have backers from economic science to find a good solution. And, first of all, we have to have good measurements and metrics. Just like a business has a balance sheet, we must have an excellent balance sheet in terms of inclusive wealth, produced capital, human capital and natural capital that people can add on if they want. I understand many of our friends. They're also talking about social capital, no harm, do it. I mean, if the accounting price or shadow price is not able to capture some of the nuances of the market, and then maybe you can have a separate category of social capital. People are talking also about cultural capital, let's not go into that. But the idea is to have a comprehensive inclusive measurement of wealth and if that mandate is accepted, which it is getting nowadays amongst the governments, then I think valuation of biodiversity will become mandatory. And then, of course, how do you aggregate? Then you have to do the pricing and maybe markets may not be the best institution to bank on because biodiversity is measured by combining very, very different species.

I can tell you and our listeners that we go to various groups and stakeholders and the kind of question we are bombarded with, such as ethical questions, the limitations of markets, the pitfalls of market-friendly tools like valuation, market-based instruments, all those transferable development rights, biodiversity offset, wetland banking, they are under question for the right reasons, and sometimes for the wrong reason. So, just putting a dollar value on biodiversity has to be done with a lot of caveats and caution.

Even if we are able to do a partial valuation, which is in a static framework, not in a general equilibrium framework, many of my macro economist friends say that the way we are doing valuation of natural capital is not very critical. I see their point and things are changing. We should have a maybe dynamic CGE model where we have a good proxy for biodiversity, and then you can see how the final demand changes and then how perturbing the other sectors changes its value. That will be a better way to go rather than sectoral static partial valuation. Also, integration with different sectors should be done.

For biodiversity, besides valuations, certainly, it should be entered into the cost benefit analysis of the projects and policies. So far, we have seen some extended cost benefit, where people are talking about changing the cost side or benefit side and the value. You may also have seen the Green Book in UK, they are asking us to change the way we are doing valuation of natural capital, but a lot more needs to be done there in order to integrate biodiversity at the project level.

Valuation of biodiversity, even if it is partial, can be used for restoration. Once we have some value for biodiversity, which should be possible, then it is easier to justify investment in restoration activities. Otherwise, people think it is just expenditure, they don't think it is investment in the restoration activity. Very explicitly, in order to enhance the supply of the biosphere, and the supply of ecosystem services from the biosphere, we need to invest in restoration. And that can be further strengthened if we have good valuation for biodiversity. So, there are merits in valuing biodiversity. There are challenges and there are always better ways of doing it. The idea is to take this discussion on the ground and do it, help enhance the capacity of the countries to do it.

I remember a story of when I was presenting a case studies on contribution of forestry sector to India's GDP in 1996. We just estimated not only the log wood, timber and non-wood forest products, but also estimated watershed functions and the carbon. The value of contribution from forests to GDP went from 1.1% to 2.7% (if I remember correctly). And I was a little bit skeptical and defensive of

the way I had estimated watershed functions and benefits and the carbon. One of the chief statisticians of the Government of India, he said: "why were you so defensive? Do you know, how we were valuing? The rent, they were based on the survey of 1950's data." So even in case of valuation we have to be a bit brave, bold, state our assumptions upfront and move forward. Somebody who has 10 years and \$10 billion research funds can do better. But right now, we need to do it and put the caveats upfront, that fully applies to the case of valuation of biodiversity and natural capital in general. And I think if we do that, we will be making a big progress and helping the community and the practitioners.

Shall we go to a slightly different perspective, one that speaks to environmental economists. So, there are many conventions, different bodies, action plans within the UNEP. Let's say an environmental economist really wants to work on biodiversity. What would be the best starting point?

I mean, in my humble opinion, there has never been a better time for the environmental and resource economist as it is now. If you see the IPCC assessments, then in the first IPCC assessment in the 1980s, there were one or two economist among the entire 1800+ scientists. This number has grown. If you see the sixth assessment then I think it is now in the hundreds. Similarly, for IPBES and for other assessments, and all the official negotiated documents, whether it is on statistics, whether it is on the indicators of SDG, the targets and even Paris Agreement, there are a lot for the environmental economist.

Now, let us come to a specific question on biodiversity. The entry point is to go for correcting the compass of the progress and wellbeing and that is where the wealth measurement is important. In terms of wealth estimates, I think a lot more needs to be done. In fact, when we estimate produced capital, human capital and material capital, I find that the way we are measuring human capital needs a huge improvement. Just life expectancy and education is not the essence. I mean, they are the elements of human capital. What about mental health? Mr. Antonio Guterres of the UN all the time says that there's no health without mental health, especially in the post pandemic, and during this pandemic, there is a huge suffering of human capital, due to anxiety, depression and various types of disorders. Are we estimating this? Where are the estimates? No, we need to do that. So as a first entry point, I would say, let's improve this and environmental economists can really contribute. I mean, for them right now working in this area is just like fishing in a virgin lake with a huge return.

Then we need full effort on integrating: let us make the narrative that production and consumption of the economic system should be linked with the nature, which has not happened fully. It has huge economic resonance. Otherwise, we will have another pandemic very soon, I'm sorry to say this. And that is what the Dasgupta review does. So integration, mainstreaming of nature, climate and pollution into our economic system through consumption and production. And of course, a lot of effort has to go on valuations.

I can give you another example to understand it better in a minute, we are trying to create a database under to the economics of ecosystems and biodiversity of ecosystems, ecosystem services and their values. So we started getting all those data from the prime resources. And we thought we don't need to do values and because you know, in our top field journals like JAERE or JEEM, or Land Economics and occasionally Ecological Economics, they are full of such studies. We were surprised there are not many studies. And in some studies, some researcher estimated the value of forest per hectare. If I then look at what that researcher did I find that he took the coefficients from a Chinese journal. The researcher from the Chinese journal used the coefficients from some other economists,

who took that value from a graph, some institution, etc. I found that everybody's borrowing and there is a lack of primary studies. Though, we have to generate primary evidence, otherwise we will not be serving the profession. And I think we won't have a chance to succeed. So, a lot of effort should be on mainstreaming, bringing nature closer to fiscal, monetary and trade policies in order to produce valuations in a socially credible way. The foundation has to be economic theory, but in a way that it should not remain just the statistical jugglery, which is understood by three, four people. That is fine, too, but then you may not be able to help the policymakers as much as you want to.

What are your objectives next at UNEP for the coming future? And what are your hopes?

There is no personal goal and ambition here while we are serving in the UN Secretariat. So, my goal is aligned with UNEP's goal. And here we have a fascinating and at the same time very daunting goal to bring nature closer to society and economy and economics.

I really want that some of the basic environmental economics theory, whether it is valuation, whether it is accounting, whether it is mainstreaming, is really used on the ground, and especially in the south. I see sadly a bit difference in the level, which is expected as in Europe the application of standard theory is in a slightly better state than in the south. At a micro level, I think a lot more work needs to be done and that is where I see myself investing time which nicely aligns with program of UNEP, we call it a medium term strategy at UNEP, how to bring human health aspects to the environmental issues. So you know, recently we have done some work with some of the scientists and some economists like Maureen Crooper who was working with us on the question of how much human capital is being lost as a result of air pollution in India, in Ghana, in Ruanda, in Ethiopia, and also in China. That estimates should be entering into the decision making tools and the process when the countries allocate resources on health and to the control of air pollution. Because you are harvesting a good synergy by allocating resource for controlling of air pollution. I've been in touch with some mental health experts and psycho analyst and a clinical psychologist, and I see a great merit in analyzing the impact of nature on mental health. This is not just a biophysical relationship, but where is the economic evidence? How much is the benefits of nature accruing to the society due to amelioration of mental sickness? I think these are some of the things I see myself at least a few years from now working and convincing the government to use these estimates because this work is not only for journals.

Finally, the perennial challenge of capacity development. I'm based in Nairobi, in Kenya, in Sub Saharan Africa. And I can tell you, there is a big return if we spend our time on capacity building, and I think I see myself doing a bit of that as well. And finally, I really want the best of the best science and best economic theory trickle down to UNEPs program of works, and I can say that I am contributing my bit towards closing the gap between science and policy.

Background information on Pushpam Kumar:

His main expertise is in applying economics to issues of biodiversity and ecosystem services. Pushpam has a PhD in environmental economics and also holds the position of honorary research scientist at the Earth Institute of Columbia University in New York, and is an extraordinary professor at the University of Pretoria. He has published in peer reviewed journals such as Science, Ecological Economics, and written several books. So in the past, Pushpam has served as a member of the UK Expert Panel of the National Ecosystem Assessment, is an advisory board member of the Gulbenkian Ocean Initiative, lead author for the Fourth Assessment of the IPCC review, co-coordinating lead

author of the responses working group of the Millennium Ecosystem Assessment, has co-chaired the Policy and Technical Committee of the Wealth Accounting and Valuation of Ecosystem Services Program led by the World Bank. I would say most environmental economists will know him for his really ground-breaking work on inclusive wealth. So this was a real game changer, and really helped us to gain valuable insights in whether or not countries are running down the natural resources in order to increase economic growth. And one of his conclusions, unfortunately, was that many countries are depleting the ecosystems for just that purpose.